

THAT WHICH IS CLAIMED:

1. A method of reducing pathogenicity of a fungus producing fumonisin, comprising:

stably integrating into the genome of a plant cell a primary nucleotide sequence operably linked to a promoter active in said plant cell, said primary nucleotide sequence comprising at least one sequence selected from the group consisting of a sequence encoding a polypeptide having fumonisin esterase activity and amine oxidase activity; and, stably integrating into the genome of said plant cell a secondary nucleotide sequence operably linked to a promoter active in said plant cell, wherein said secondary nucleotide sequence comprises at least one sequence selected from the group consisting of:

a) a nucleotide sequence having at least 70% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7 or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity;

b) a nucleotide sequence having at least 80% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7 or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity;

c) a nucleotide sequence that hybridizes under stringent conditions to the complement of the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7, or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity; and,

d) a nucleotide sequence encoded by the polypeptide set forth in SEQ ID NO: 3, 5, 8, or 11.

2. The method of claim 1, wherein said primary nucleotide sequence encoding a polypeptide having fumonisin esterase activity is ESP1 or BEST1.

3. The method of claim 1, wherein said primary nucleotide sequence encoding a polypeptide having amine oxidase activity is APAO.

4. The method of claim 1, wherein the primary nucleotide sequence stably incorporated into the plant cell comprises the sequence encoding a polypeptide having fumonisin esterase activity and the sequence encoding a polypeptide having amino oxidase activity.

5. The method of claim 1, wherein said plant is a monocot.

6. The method of claim 5, wherein said monocot is maize.

7. The method of claim 1, wherein said plant is a dicot.

8. The method of claim 1, where said promoters are inducible.

9. The method of claim 8 further comprising inducing expression of said primary and said secondary nucleotide sequence for a time sufficient to reduce pathogenicity of said fungus.

10. A plant having stably integrating into its genome

a) a primary nucleotide sequence operably linked to a promoter active in said plant, said primary nucleotide sequence comprising at least one nucleotide sequence selected from the group consisting of a sequence encoding a polypeptide having fumonisin esterase activity or amine oxidase activity; and,

b) a secondary nucleotide sequence operably linked to a promoter active in said plant, wherein said secondary nucleotide sequence comprises at least one sequence selected from the group consisting of:

i) a nucleotide sequence having at least 70% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7 or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity;

ii) a nucleotide sequence having at least 80% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7 or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity;

iii) a nucleotide sequence that hybridizes under stringent conditions to the complement of the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7, or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity; and,

iv) a nucleotide sequence encoded by the polypeptide set forth in SEQ ID NO: 3, 5, 8, or 11.

11. The plant of claim 10, wherein said primary nucleotide sequence encoding a polypeptide having fumonisin esterase activity is ESP1 or BEST1.

12. The plant of claim 10, wherein said primary nucleotide sequence encoding a polypeptide having amine oxidase activity is APAO.

13. The method of claim 10, wherein the primary nucleotide sequence stably incorporated into the plant cell comprises a sequence encoding a polypeptide having fumonisin esterase activity and a sequence encoding a polypeptide having amino oxidase activity.

14. The plant of claim 10, wherein said plant is a monocot.

15. The plant of claim 14, wherein said monocot is maize.

16. The plant of claim 10, wherein said plant is a dicot.

17. The transformed seed of the plant of claim 10.

18. A plant cell having stably integrating into its genome

a) a primary nucleotide sequence operably linked to a promoter active in said plant cell, said primary nucleotide sequence comprising at least one nucleotide sequence selected from the group consisting of a sequence encoding a polypeptide having fumonisin esterase activity or amine oxidase activity; and,

b) a secondary nucleotide sequence operably linked to a promoter active in said plant, wherein said secondary nucleotide sequence comprises at least one sequence selected from the group consisting of:

i) a nucleotide sequence having at least 70% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7 or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity;

ii) a nucleotide sequence having at least 80% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7 or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity;

iii) a nucleotide sequence that hybridizes under stringent conditions to the complement of the nucleotide sequence set forth in SEQ ID NO: 2, 4, 7, or 10, wherein said sequence encodes a polypeptide having fumonisin detoxification activity; and,

iv) a nucleotide sequence encoded by the polypeptide set forth in SEQ ID NO: 3, 5, 8, or 11.

19. A method of reducing pathogenicity of a fungus producing fumonisin, comprising:

stably integrating into the genome of a plant cell:

a) a primary nucleotide sequence operably linked to a promoter active in said plant cell, said primary nucleotide sequence comprising at least one nucleotide sequence selected from the group consisting of a sequence encoding a polypeptide having fumonisin esterase activity or amine oxidase activity; and,

b) a secondary nucleotide sequence operably linked to a promoter active in said plant cell, wherein said secondary nucleotide sequence comprises at least one sequence selected from the group consisting of a nucleotide sequence set forth in one of SEQ ID NO: 2, 4, 7, and 10.

20. A plant having stably integrating into its genome

a) a primary nucleotide sequence operably linked to a promoter active in said plant cell, said primary nucleotide sequence comprising at least one nucleotide

sequence selected from the group consisting of a sequence encoding a polypeptide having fumonisin esterase activity or amine oxidase activity; and,

b) a secondary nucleotide sequence operably linked to a promoter active in said plant, wherein said secondary nucleotide sequence comprises at least one sequence selected from the group consisting of a nucleotide sequence set forth in one of SEQ ID NO: 2, 4, 7, and 10.

RTA01/2094891v1